

**WHAT IS CLAIMED IS:**

1        1. A method of causing an improvement in function of the central nervous system of  
2    a subject having impaired central nervous system function, comprising administering to the  
3    subject an aliquot of cells derived from umbilical cord blood.

1        2. A method of causing an improvement in a function of the central nervous system  
2    of a subject, comprising administering to the subject an aliquot of cells derived from blood,  
3    the aliquot containing stem cells.

1        3. A method of causing an improvement in a function of the central nervous system  
2    of a subject, comprising administering to the subject an aliquot of cells derived from blood  
3    and a growth factor.

1        4. The method of claim 2 or 3 wherein the cells are derived from umbilical cord  
2    blood.

1        5. The method of claim 2 or 3 wherein the cells are derived from peripheral blood.

1        6. The method of claim 1, 2 or 3 further comprising obtaining the aliquot of cells by  
2    separating a desired cell population from the cord blood.

1        7. The method of claim 3 wherein the growth factor is selected from the group  
2    consisting of oncostatin M and growth factors from the following families: FGF,  
3    neurotrophin, IGF, CNTF, EGF, TGF-beta, LIF, interleukins, PDGF and VEGF.

1        8. The method of claim 1, 2 or 3 further comprising obtaining a sample of cells and  
2    purifying the sample to obtain the aliquot.

1        9. The method of claim 1, 2 or 3 further comprising obtaining a sample of cells and  
2    expanding at least a selected population of cells in the sample ex vivo to obtain the aliquot.

1           10. The method of claim 1, 2 or 3 wherein said aliquot of cells comprises allogeneic  
2       cells.

1           11. The method of claim 1, 2 or 3 wherein said aliquot of cells comprises autologous  
2       cells.

1           12. The method of claim 1, 2 or 3 wherein the improvement results in recovery from  
2       a central nervous system trauma.

1           13. The method of claim 1, 2 or 3 wherein the improvement results in repair of  
2       central nervous system damage.

1           14. The method of claim 1, 2 or 3 wherein the improvement results in repair of  
2       central nervous system disease.

1           15. The method of claim 1, 2 or 3 wherein the improvement results in regeneration of  
2       central nervous system tissue.

1           16. The method of claim 1, 2, or 3 wherein the improvement comprises measurable  
2       stroke recovery.

1           17. The method of claim 1, 2, or 3 wherein the improvement is the result of stroke  
2       repair.

1           18. The method of claim 1 wherein the improvement results from tissue regeneration  
2       after a stroke.

1           19. The method of claim 1, 2 or 3 wherein the improvement results from a genetic  
2       element contained in the administered cells.

1           20. The method of claim 19 wherein the genetic element is endogenous to the  
2       administered cells.

- 1        21. The method of claim 19 wherein the genetic element has been exogenously  
2 added to the administered cells.
- 1        22. The method of claim 1, 2 or 3 wherein the improvement comprises head trauma  
2 recovery.
- 1        23. The method of claim 1, 2 or 3 wherein the improvement comprises head trauma  
2 repair.
- 1        24. The method of claim 1, 2 or 3 wherein the improvement results from tissue  
2 regeneration after head trauma.
- 1        25. The method of claim 1 or 2 wherein the cells are administered intercerebrally,  
2 intracisternally, intracerebroventricularly, or intraparenchymally.
- 1        26. The method of claim 1 wherein the cells are CD 34+/-, Lin- cells or precursor  
2 cells.
- 1        27. The method of claim 26 wherein the cells are characterized as: CD2<sup>-</sup>, CD3<sup>+</sup>, CD14<sup>+</sup>,  
2 CD16<sup>+</sup>, CD19<sup>+</sup>, CD24<sup>+</sup>, CD56<sup>+</sup>, CD66b<sup>+</sup>, glycophorin A<sup>+</sup>, flk-1<sup>+</sup>, CD45<sup>+</sup>, CXCR4<sup>+</sup>, MDR<sup>+</sup>.
- 1        28. The method of claim 1, 2 or 3 wherein the improvement results from treatment of  
2 one of the following diseases: Parkinson's Disease, Alzheimer's Disease, Huntington's  
3 Disease, ALS, MS, Tay-Sachs, and cerebral palsy.
- 1        29. The method of claim 1, 2 or 3 further comprising administering to the subject a  
2 cell differentiation factor.
- 1        30. The method of claim 1, 2 or 3 further comprising administering to the subject a  
2 neural guidance molecule.

1        31. The method of claim 3 wherein the growth factor is administered intercerebrally,  
2 intracisternally, intracerebroventricularly, or intraparenchymally.

1        32. The method of claim 3 wherein the growth factor is administered with the aliquot  
2 of cells.

1        33. The method of claim 3 wherein the growth factor is administered separately from  
2 the aliquot of cells.

1        34. The method of claim 1, 2 or 3 wherein the aliquot of cells is administered directly  
2 to a site of brain injury.

1        35. The method of claim 13 wherein the damage is due to lack of oxygen to the  
2 brain.

1        36. The method of claim 35 wherein the damage is due to stroke or asphyxiation.

1        37. A method of causing an improvement in central nervous system function of a  
2 patient comprising:

3            obtaining an aliquot containing a predetermined target population of cells by  
4            (a) introducing a starting sample of cells into a growth medium  
5            (b) causing cells of the predetermined target population to divide; and  
6            (c) concurrently with, intermittently during, or following step (b), contacting  
7            the cells in the growth medium with a selection element, so as to select cells of the target  
8            population from other cells in the growth medium; and  
9            administering the aliquot to the patient.

1        38. The method of claim 37 wherein the selection element comprises a plurality of  
2 selective binding molecules with affinity either for target cells or for a first population of  
3 non-target cells.

1        39. The method of claim 37 wherein the starting sample is cord blood or is derived  
2 from cord blood.

1        40. The method of claim 37 wherein said aliquot of cells comprises CD 34+/-, Lin-  
2 cells.

1        41. The method of claim 37 wherein said expansion is clonogenic.

add c3)